

511

ROD/PISTON SEAL

*Single-Acting
TPU/TPE with O-Ring Energizer*

DESIGN

The Hallite 511 is a standard profile loaded U-cup with precision trimmed sealing lips manufactured in either a polyurethane or polyester shell energised by a high quality O-ring and designed for common North American square grooves.

At zero or low pressure, the O-ring helps to increase the sealing force preventing any bypass. Under most conditions as the pressure rises, the sealing force increases and the O-ring ensures complete lip actuation.

The symmetry of the Hallite 511 makes it ideally suited for single-acting rod and piston applications and its flexibility enables easy installation. The 511 can also be fitted back-to-back for use in double-acting applications. Although the Hallite 511 can be used as a rod seal, other Hallite non-square rod seals are more suitable options, such as the Hallite 513, 605, or 621.



FEATURES

- Excellent resistance to abrasion
- Precision trimmed lips
- Positive lip actuation
- Easy to install

MATERIALS

This product comes in a number of material options to extend operating conditions. Contact your local Hallite technical team to decide which is best for your application. Use the part designator in the table below as the last digit of the part number to specify material choice when ordering. For further material details, please refer to the Hallite Material Table.

MATERIAL OPTIONS	Name	Seal Type	Seal Color	Part Designator
Standard	Hythane® 221-NBR	TPU-EU	Black	10
Optional	TPE 121-NBR	TPE	Orange	11
Optional	TPE 121-FKM	TPE	Orange	12
Optional	Hythane® 361-NBR	TPU-AU	Orange	16

TECHNICAL DETAILS

OPERATING CONDITIONS	METRIC	INCH
Maximum Speed	0.5 m/sec	1.5 ft/sec
Temperature Range	-40°C +110°C	-40°F +230°F
Maximum Pressure	350 bar	5000 psi

NOTE

Data given are maximum values and can apply depending on specific application. Maximum ratings of temperature, pressure, or operating speeds are dependent on fluid medium, surface, gap value, and other variables such as dynamic or static service. Maximum values are not intended for use together at the same time, e.g. max temperature and max pressure. Please contact your Hallite technical representative for application support.

MAXIMUM EXTRUSION GAP - 1/4 SECTION AND ABOVE			
Pressure bar	160	250	350
Maximum Gap mm	0.60	0.50	0.40
Pressure psi	2400	3750	6000
Maximum Gap in	0.024	0.020	0.016

NOTE

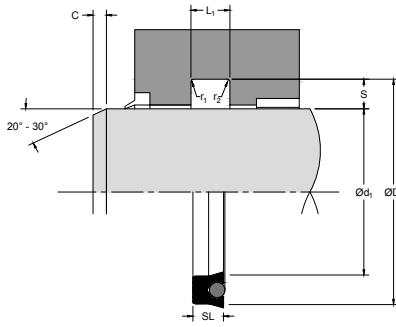
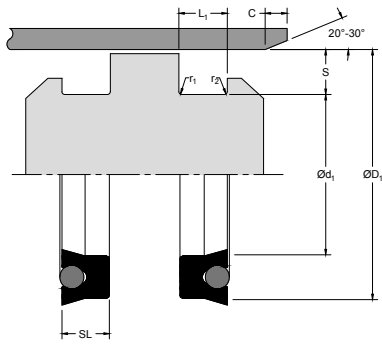
Figures show the maximum permissible gap all on one side using minimum rod \varnothing and maximum clearance \varnothing . Refer to Housing Design section.

SURFACE ROUGHNESS	μmRa	μmRz	μmRt	μinRa	μinRz	μinRt
Dynamic Sealing Face Rod - $\varnothing d_1$	0.1 - 0.4	1.6 max	4 max	4 - 16	63 max	157 max
Static Sealing Face Rod - $\varnothing D_1$	1.6 max	6.3 max	10 max	63 max	250 max	394 max
Dynamic Sealing Face Piston - $\varnothing D_1$	0.1 - 0.4	1.6 max	4 max	4 - 16	63 max	157 max
Static Sealing Face Piston - $\varnothing d_1$	1.6 max	6.3 max	10 max	63 max	250 max	394 max
Static Housing Faces L_1	3.2 max	10 max	16 max	125 max	394 max	630 max

RADII							
Groove Section $\leq S$ in	0.125	0.187	0.250	0.312	0.375	0.500	0.625
Min Chamfer C in	0.093	0.093	0.125	0.156	0.187	0.187	0.217
Max Fillet Rad r_1 in	0.008	0.008	0.016	0.032	0.032	0.032	0.047
Max Fillet Rad r_2 in	0.016	0.016	0.032	0.047	0.047	0.047	0.062

NOTE

Please refer to specified tolerances in the introduction page of the Hallite 500 Series.



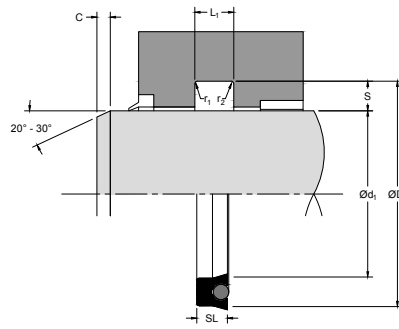
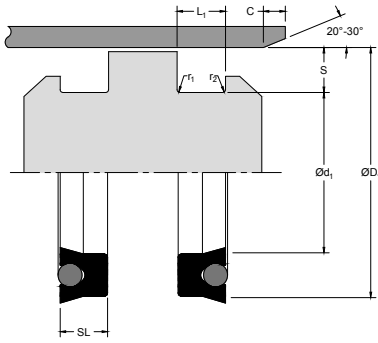
511

ROD/PISTON SEAL

Single-Acting
TPU/TPE with O-Ring Energizer

PART NUMBER RANGE

INCH					
$\varnothing d_1$	$\varnothing D_1$	SL	L_1	STANDARD REFERENCE	PART No.
1/8 CROSS SECTION					
0.063	0.313	0.125	0.138	12500063	8920810
0.125	0.375	0.125	0.138	12500125	8900810
0.188	0.438	0.125	0.138	12500188	8800110
0.250	0.500	0.125	0.138	12500250	8800210
0.313	0.563	0.125	0.138	12500313	8902810
0.375	0.625	0.125	0.138	12500375	8800410
0.438	0.688	0.125	0.138	12500438	8905110
0.500	0.750	0.125	0.138	12500500	8800610
0.563	0.813	0.125	0.138	12500563	8844610
0.625	0.875	0.125	0.138	12500625	8800810
0.688	0.938	0.125	0.138	12500688	8801010
0.750	1.000	0.125	0.138	12500750	8801110
0.813	1.063	0.125	0.138	12500813	8815310
0.875	1.125	0.125	0.138	12500875	8801410
0.938	1.188	0.125	0.138	12500938	8844810
1.000	1.250	0.125	0.138	12501000	8801610
1.063	1.313	0.125	0.138	12501063	8801810
1.125	1.375	0.125	0.138	12501125	8801910
1.188	1.438	0.125	0.138	12501188	8921310
1.250	1.500	0.125	0.138	12501250	8802210
1.375	1.625	0.125	0.138	12501375	8802410
1.500	1.750	0.125	0.138	12501500	8802610
1.625	1.875	0.125	0.138	12501625	8802810
1.750	2.000	0.125	0.138	12501750	8803010
1.875	2.125	0.125	0.138	12501875	8803210
2.000	2.250	0.125	0.138	12502000	8803410
2.250	2.500	0.125	0.138	12502250	8803810
2.375	2.625	0.125	0.138	12502375	8815610
2.500	2.750	0.125	0.138	12502500	8800310
2.750	3.000	0.125	0.138	12502750	8817910
2.875	3.125	0.125	0.138	12502875	8814210



PART NUMBER RANGE

INCH

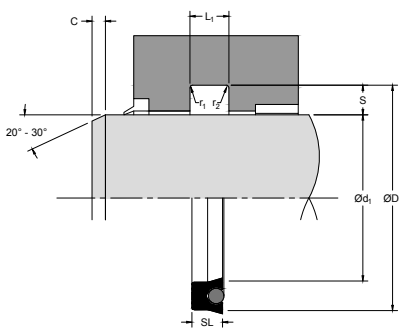
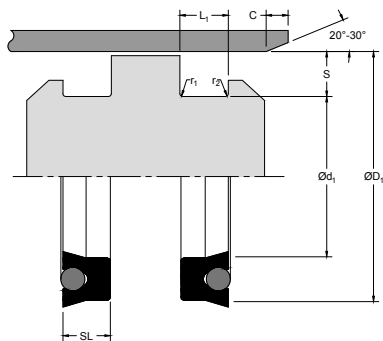
Ød_1	ØD_1	SL	L_1	STANDARD REFERENCE	PART No.
3.000	3.250	0.125	0.138	12503000	8804510
3.250	3.500	0.125	0.138	12503250	8819610
3.500	3.750	0.125	0.138	12503500	8815810
3.750	4.000	0.125	0.138	12503750	8818710
3.875	4.125	0.125	0.138	12503875	8816510
4.000	4.250	0.125	0.138	12504000	8805210
4.250	4.500	0.125	0.138	12504250	8819710
4.750	5.000	0.125	0.138	12504750	8818110
4.875	5.125	0.125	0.138	12504875	8816710

5/32 CROSS SECTION

1.000	1.313	0.156	0.172	15651000	8810110
1.187	1.500	0.156	0.172	15651187	8811010
1.250	1.563	0.156	0.172	15651250	8813810
1.375	1.688	0.156	0.172	15651375	8813910

3/16 CROSS SECTION

0.375	0.750	0.188	0.207	18750375	8902910
0.500	0.875	0.188	0.207	18750500	8800710
0.563	0.938	0.188	0.207	18750563	8932810
0.625	1.000	0.188	0.207	18750625	8800910
0.750	1.125	0.188	0.207	18750750	8801210
0.875	1.250	0.188	0.207	18750875	8801510
1.000	1.375	0.188	0.207	18751000	8801710
1.125	1.500	0.188	0.207	18751125	8802010
1.188	1.563	0.188	0.207	18751188	8851710
1.250	1.625	0.188	0.207	18751250	8802310
1.375	1.750	0.188	0.207	18751375	8802510
1.500	1.875	0.188	0.207	18751500	8802710
1.625	2.000	0.188	0.207	18751625	8802910
1.750	2.125	0.188	0.207	18751750	8803110
1.875	2.250	0.188	0.207	18751875	8803310
2.000	2.375	0.188	0.207	18752000	8803510
2.125	2.500	0.188	0.207	18752125	8803710



511

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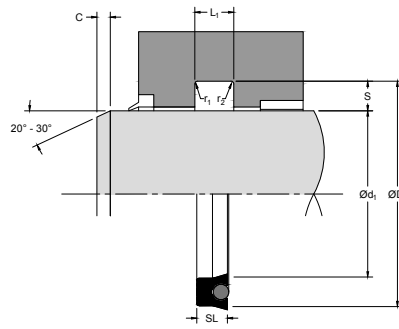
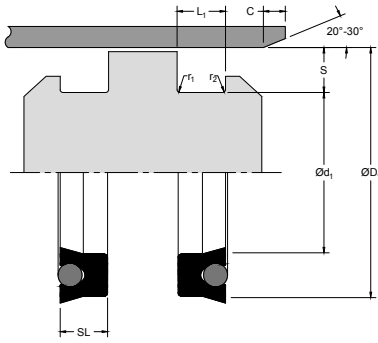
PART NUMBER RANGE

INCH					
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2.375	2.750	0.188	0.207	18752375	8804010
2.500	2.875	0.188	0.207	18752500	8804110
2.625	3.000	0.188	0.207	18752625	8804210
2.750	3.125	0.188	0.207	18752750	8804410
2.875	3.250	0.188	0.207	18752875	8851010
3.000	3.375	0.188	0.207	18753000	8804610
3.125	3.500	0.188	0.207	18753125	8804710
3.250	3.625	0.188	0.207	18753250	8804810
3.375	3.750	0.188	0.207	18753375	8854210
3.500	3.875	0.188	0.207	18753500	8805010
3.625	4.000	0.188	0.207	18753625	8805110
3.750	4.125	0.188	0.207	18753750	8879410
3.875	4.250	0.188	0.207	18753875	8823510
4.000	4.375	0.188	0.207	18754000	8805310
4.125	4.500	0.188	0.207	18754125	8805410
4.250	4.625	0.188	0.207	18754250	8805510
4.375	4.750	0.188	0.207	18754375	8854310
4.500	4.875	0.188	0.207	18754500	8805710
4.625	5.000	0.188	0.207	18754625	8879510
4.875	5.250	0.188	0.207	18754875	8823610
5.125	5.500	0.188	0.207	18755125	8908510
7/32 CROSS SECTION					
2.500	2.937	0.218	0.240	21852500	8921410
2.563	3.000	0.218	0.240	21852563	8921510
1/4 CROSS SECTION					
0.313	0.813	0.250	0.275	25000313	8824710
0.375	0.875	0.250	0.275	25000375	8865810
0.500	1.000	0.250	0.275	25000500	8806310
0.625	1.125	0.250	0.275	25000625	8806410
0.750	1.250	0.250	0.275	25000750	8806510
0.875	1.375	0.250	0.275	25000875	8806610

PART NUMBERS ON THIS PAGE ARE LISTED IN THE STANDARD MATERIAL OPTION. FOR MATERIAL VARIATIONS OR FOR CUSTOM SIZES, MATERIALS, OR SEAL DESIGNS, PLEASE CONTACT YOUR LOCAL HALLITE REPRESENTATIVE.



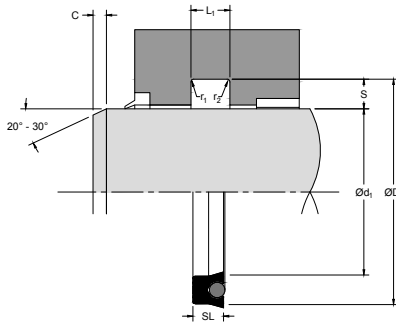
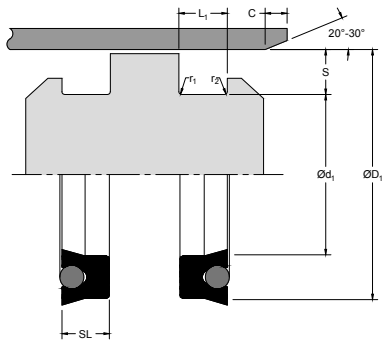
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PART NUMBER RANGE

INCH

Ød_1	ØD_1	SL	L_1	STANDARD REFERENCE	PART No.
0.938	1.438	0.250	0.275	25000938	8921010
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1.125	1.625	0.250	0.275	25001125	8807010
1.188	1.688	0.250	0.275	25001188	8921210
1.250	1.750	0.250	0.275	25001250	8807210
1.375	1.875	0.250	0.275	25001375	8807310
1.500	2.000	0.203	0.223	25001500	8801310
1.500	2.000	0.250	0.275	25001500	8807510
1.625	2.125	0.250	0.275	25001625	8807710
1.750	2.250	0.250	0.275	25001750	8807810
1.875	2.375	0.250	0.275	25001875	8808010
2.000	2.500	0.250	0.275	25002000	8808210
2.125	2.625	0.250	0.275	25002125	8808410
2.250	2.750	0.250	0.275	25002250	8808610
2.375	2.875	0.250	0.275	25002375	8808810
2.500	3.000	0.203	0.223	25002500	8803610
2.500	3.000	0.250	0.275	25002500	8809010
2.625	3.125	0.250	0.275	25002625	8809110
2.750	3.250	0.250	0.275	25002750	8809210
2.875	3.375	0.250	0.275	25002875	8809410
3.000	3.500	0.203	0.223	25003000	8816110
3.000	3.500	0.250	0.275	25003000	8809610
3.250	3.750	0.250	0.275	25003250	8810010
3.375	3.875	0.250	0.275	25003375	8850710
3.500	4.000	0.203	0.223	25003500	8817210
3.500	4.000	0.250	0.275	25003500	8810310
3.625	4.125	0.250	0.275	25003625	8810510
3.750	4.250	0.250	0.275	25003750	8810610
3.875	4.375	0.250	0.275	25003875	8810710
4.000	4.500	0.250	0.275	25004000	8810810
4.250	4.750	0.250	0.275	25004250	8811210
4.375	4.875	0.250	0.275	25004375	8811410



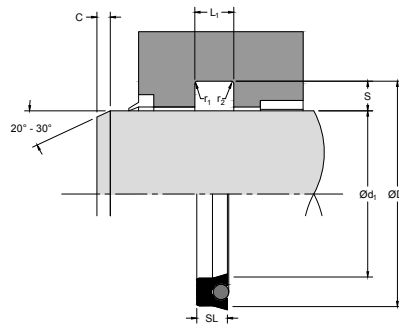
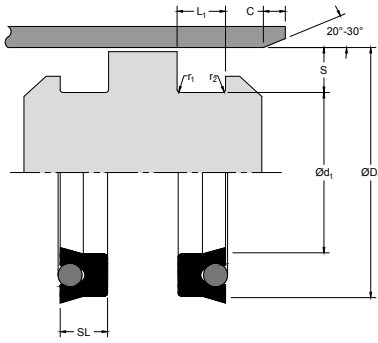
511

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Single-Acting
TPU/TPE with O-Ring Energizer

PART NUMBER RANGE

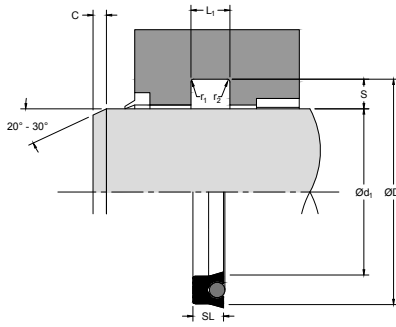
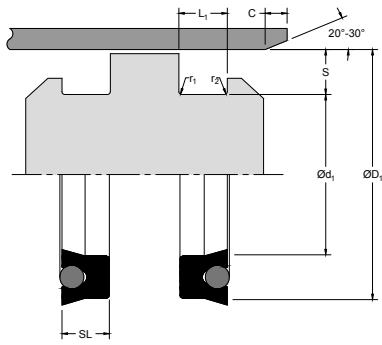
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4.625	5.125	0.250	0.275	25004625	8811810
4.750	5.250	0.250	0.275	25004750	8811910
4.875	5.375	0.250	0.275	25004875	8856510
5.000	5.500	0.250	0.275	25005000	8812010
5.250	5.750	0.250	0.275	25005250	8812210
5.500	6.000	0.250	0.275	25005500	8812410
5.750	6.250	0.250	0.275	25005750	8812610
6.000	6.500	0.250	0.275	25006000	8812810
6.250	6.750	0.250	0.275	25006250	8856610
6.500	7.000	0.250	0.275	25006500	8813110
6.750	7.250	0.250	0.275	25006750	8813210
7.000	7.500	0.250	0.275	25007000	8813310
7.250	7.750	0.250	0.275	25007250	8856710
7.500	8.000	0.250	0.275	25007500	8813410
7.750	8.250	0.250	0.275	25007750	8921810
8.000	8.500	0.250	0.275	25008000	8813610
8.250	8.750	0.250	0.275	25008250	8856810
8.500	9.000	0.250	0.275	25008500	8813710
11.500	12.000	0.250	0.275	25011500	8922210
9/32 CROSS SECTION					
5.437	6.000	0.281	0.310	28155437	8921710
5/16 CROSS SECTION					
0.250	0.875	0.312	0.344	31250250	8899710
0.375	1.000	0.313	0.344	31250375	8824910
0.688	1.313	0.312	0.344	31250688	8906710
0.875	1.500	0.313	0.344	31250875	8920910
1.000	1.625	0.313	0.344	31251000	8806910
1.125	1.750	0.313	0.344	31251125	8807110
1.188	1.813	0.313	0.344	31251188	8933010
1.250	1.875	0.313	0.344	31251250	8870010



PART NUMBER RANGE

INCH

$\text{Ø}d_1$	$\text{Ø}D_1$	SL	L_1	STANDARD REFERENCE	PART No.
1.375	2.000	0.313	0.344	31251375	8807410
1.500	2.125	0.313	0.344	31251500	8807610
1.625	2.250	0.313	0.344	31251625	8850910
1.750	2.375	0.313	0.344	31251750	8807910
1.875	2.500	0.313	0.344	31251875	8808110
2.000	2.625	0.313	0.344	31252000	8808310
2.125	2.750	0.313	0.344	31252125	8808510
2.250	2.875	0.313	0.344	31252250	8808710
2.375	3.000	0.313	0.344	31252375	8808910
2.500	3.125	0.313	0.344	31252500	8870110
2.625	3.250	0.313	0.344	31252625	8851110
2.750	3.375	0.313	0.344	31252750	8809310
2.875	3.500	0.313	0.344	31252875	8809510
3.000	3.625	0.313	0.344	31253000	8809710
3.125	3.750	0.313	0.344	31253125	8809910
3.250	3.875	0.313	0.344	31253250	8879610
3.375	4.000	0.313	0.344	31253375	8810210
3.500	4.125	0.313	0.344	31253500	8810410
3.550	4.175	0.250	0.275	31253550	8899510
3.625	4.250	0.313	0.344	31253625	8851210
3.750	4.375	0.313	0.344	31253750	8870210
3.875	4.500	0.313	0.344	31253875	8870310
4.000	4.625	0.313	0.344	31254000	8810910
4.125	4.750	0.313	0.344	31254125	8811110
4.250	4.875	0.313	0.344	31254250	8811310
4.375	5.000	0.313	0.344	31254375	8811510
4.500	5.125	0.313	0.344	31254500	8811710
4.750	5.375	0.313	0.344	31254750	8879710
4.875	5.500	0.313	0.343	31254875	8921610
5.000	5.625	0.313	0.344	31255000	8812110
5.250	5.875	0.313	0.344	31255250	8856910
5.375	6.000	0.313	0.344	31255375	8812310



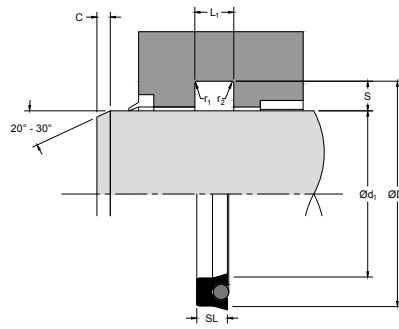
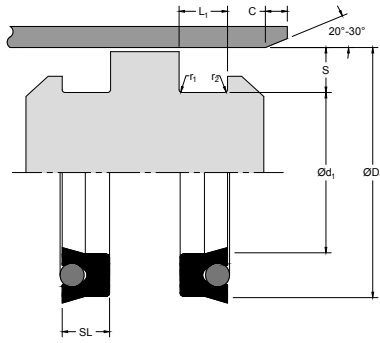
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ROD/PISTON SEAL

Single-Acting
TPU/TPE with O-Ring Energizer

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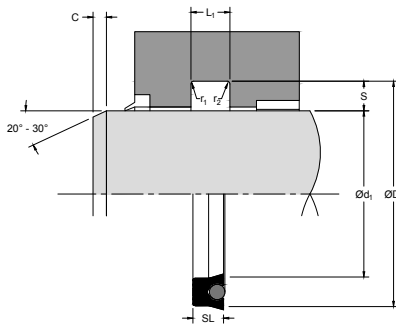
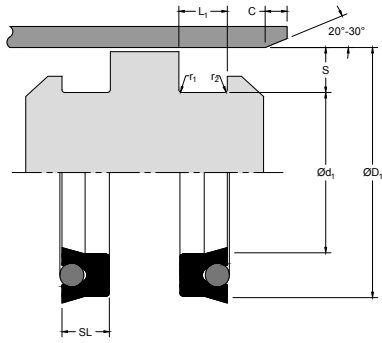
INCH					
ϕd_1	ϕD_1	SL	L_1	STANDARD REFERENCE	PART No.
5.500	6.125	0.313	0.344	31255500	8812510
5.750	6.375	0.313	0.344	31255750	8857010
6.000	6.625	0.313	0.344	31256000	8812910
6.250	6.875	0.313	0.344	31256250	8857110
6.375	7.000	0.313	0.344	31256375	8813010
6.500	7.125	0.313	0.344	31256500	8876610
6.750	7.375	0.313	0.344	31256750	8857210
7.000	7.625	0.313	0.344	31257000	8879310
7.250	7.875	0.313	0.344	31257250	8857310
7.375	8.000	0.313	0.344	31257375	8876710
7.500	8.125	0.313	0.344	31257500	8813510
7.750	8.375	0.313	0.344	31257750	8857410
8.000	8.625	0.313	0.344	31258000	8876910
8.250	8.875	0.313	0.344	31258250	8857510
8.500	9.125	0.313	0.344	31258500	8857610
3/8 CROSS SECTION					
0.875	1.625	0.375	0.413	37500875	8933210
1.000	1.750	0.375	0.413	37501000	8819110
1.125	1.875	0.375	0.413	37501125	8921110
1.250	2.000	0.375	0.413	37501250	8814310
1.375	2.125	0.375	0.413	37501375	8814410
1.500	2.250	0.375	0.413	37501500	8814510
1.625	2.375	0.375	0.413	37501625	8814710
1.750	2.500	0.375	0.413	37501750	8814810
2.000	2.750	0.375	0.413	37502000	8814910
2.125	2.875	0.375	0.413	37502125	8815110
2.250	3.000	0.375	0.413	37502250	8869910
2.500	3.250	0.375	0.413	37502500	8815410
2.750	3.500	0.375	0.413	37502750	8815710
3.000	3.750	0.375	0.413	37503000	8815910
3.250	4.000	0.375	0.413	37503250	8816210
3.375	4.125	0.375	0.413	37503375	8857710



PART NUMBER RANGE

INCH

$\text{Ø}d_1$	$\text{Ø}D_1$	SL	L_1	STANDARD REFERENCE	PART No.
3.500	4.250	0.375	0.413	37503500	8816410
3.625	4.375	0.375	0.413	37503625	8824610
3.750	4.500	0.375	0.413	37503750	8816610
3.875	4.625	0.375	0.413	37503875	8819210
4.000	4.750	0.375	0.413	37504000	8816810
4.125	4.875	0.375	0.413	37504125	8853210
4.250	5.000	0.375	0.413	37504250	8817010
4.500	5.250	0.375	0.413	37504500	8817310
4.750	5.500	0.375	0.413	37504750	8817510
5.000	5.750	0.375	0.413	37505000	8817610
5.250	6.000	0.375	0.413	37505250	8817810
5.500	6.250	0.375	0.413	37505500	8818010
5.625	6.375	0.375	0.413	37505625	8814110
5.750	6.500	0.375	0.413	37505750	8818210
6.000	6.750	0.375	0.413	37506000	8818310
6.250	7.000	0.375	0.413	37506250	8818510
6.500	7.250	0.375	0.413	37506500	8818610
6.750	7.500	0.375	0.413	37506750	8818810
7.000	7.750	0.375	0.413	37507000	8877010
7.250	8.000	0.375	0.413	37507250	8818910
7.500	8.250	0.375	0.413	37507500	8877110
7.625	8.375	0.375	0.413	37507625	8814010
7.750	8.500	0.375	0.413	37507750	8853910
8.000	8.750	0.375	0.413	37508000	8869210
8.250	9.000	0.375	0.413	37508250	8851410
8.750	9.500	0.375	0.413	37508750	8921910
10.000	10.750	0.375	0.413	37510000	8922010
11.000	11.750	0.375	0.413	37511000	8922110
1/2 CROSS SECTION					
1.500	2.500	0.500	0.550	50001500	8814610
1.875	2.875	0.500	0.550	50001875	8825510
2.000	3.000	0.500	0.550	50002000	8815010



511

ROD/PISTON SEAL

Single-Acting
TPU/TPE with O-Ring Energizer

PART NUMBER RANGE

INCH					
$\varnothing d_1$	$\varnothing D_1$	SL	L_1	STANDARD REFERENCE	PART No.
2.125	3.125	0.500	0.550	50002125	8853110
2.500	3.500	0.500	0.550	50002500	8815510
2.750	3.750	0.500	0.550	50002750	8900010
3.000	4.000	0.500	0.550	50003000	8816010
3.375	4.375	0.500	0.550	50003375	8866910
4.000	5.000	0.500	0.550	50004000	8816910
4.250	5.250	0.500	0.550	50004250	8858910
4.500	5.500	0.500	0.550	50004500	8817410
5.000	6.000	0.500	0.550	50005000	8817710
5.125	6.125	0.500	0.550	50005125	8851810
5.250	6.250	0.500	0.550	50005250	8900110
5.375	6.375	0.500	0.550	50005375	8863610
6.000	7.000	0.500	0.550	50006000	8818410
6.250	7.250	0.500	0.550	50006250	8857810
6.500	7.500	0.500	0.550	50006500	8815210
7.000	8.000	0.500	0.550	50007000	8851310
7.250	8.250	0.500	0.550	50007250	8857910
7.375	8.375	0.500	0.550	50007375	8863910
7.500	8.500	0.500	0.550	50007500	8851610
8.000	9.000	0.500	0.550	50008000	8819010
8.125	9.125	0.500	0.550	50008125	8853810
9.000	10.000	0.500	0.550	50009000	8905410
5/8 CROSS SECTION					
2.750	4.000	0.625	0.688	62502750	8819310
3.250	4.500	0.625	0.688	62503250	8822410
4.250	5.500	0.625	0.688	62504250	8819810
4.750	6.000	0.625	0.688	62504750	8819410
6.500	7.750	0.625	0.688	62506500	8819910
6.750	8.000	0.625	0.688	62506750	8819510